EV 175422291 US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In Re Application of:	)	
LUFFEL, Robert, W., *et al.*	)	Examiner: Davis, D.
Serial No. 09/371,708	)	Group Art Unit: 2652
Filing Date: August 9, 1999	)	Conf. No.: 9563
For: LATERALLY EXPANDABLE MODULAR DATA STORAGE SYSTEM	)	

APPEAL BRIEF

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APPEAL BRIEF

To: The Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

This Appeal Brief is submitted in response to the final rejections of the claims dated November 5, 2001. A Notice of Appeal was filed on March 5, 2002.

REAL PARTY IN INTEREST

The assignee of the entire right, title, and interest in the patent application is Hewlett-Packard Company.

RELATED APPEALS AND INTERFERENCES

There is a related appeal of another United States patent application, serial no. 09/337,802, filed June 22, 1999, that may directly affect, or be directly affected by, or have a bearing on, the Board's decision. There are currently no related interferences known to Appellant, Appellant's legal representative, or the assignee which will directly affect, or be directly affected by, or have a bearing on,

the Board's decision.

STATUS OF THE CLAIMS

Claims 1, 3-13, and 15-23 are pending in the application. Claims 1, 3-13, and 15-23 are rejected. The rejections of claims 1, 3-13, and 15-23 are appealed. Specifically, claims 1, 3-13, and 15-23 stand provisionally rejected under the judicially created doctrine of double patenting. Claims 1, 3-7, 10-13, 15-19, 22, and 23 stand rejected under Section 102 as being anticipated by Tadokoro. Claims 8, 9, 20, and 21 are not specifically rejected over Tadokoro, thus are allowable over Tadokoro.

STATUS OF AMENDMENTS

An amendment, dated December 18, 2001, was filed in response to the final office action, dated November 5, 2001. In an advisory action, paper no. 9, dated February 20, 2002, the examiner confirmed that claims 1, 3-13, and 15-23 continue to stand rejected, and indicated that the amendment would not be entered upon the filing of the Notice of Appeal.

SUMMARY OF INVENTION

The present invention is directed to a data storage system (200, Figure 5, p. 21, l. 19 - p. 23, l. 22) comprised of laterally adjacent modular units (e.g., 155, 157, 210, 212, 214, Figures 4 and 5, p. 20, l. 13 - p. 23, l. 22). In one embodiment, the modular data storage system (200) involves at least two laterally adjacent modular units (e.g., 155, 157, 210, 212, 214), each of which may comprise a plurality of cartridge receiving devices (e.g., 230, 232, 234, Figure 5, p. 22, l. 7 - 17) and a plurality of elongate gear racks (e.g., 20, 22, 36, 38, Figures 1-3, p. 7, l. 16 - p. 8, l. 5; p. 12, l. 6 - p. 13, l. 2; p. 13, l. 22 - p. 14, l. 2) aligned along a displacement path (14, Figures 1 and 2, p. 7, l. 11 - p. 8, l. 5; p. 8, l. 18 - p. 10, l. 9). The elongate gear racks (e.g., 20, 22, 36, 38) are substantially in alignment with one another such that a cartridge access device (e.g., 12, 112, 280, Figures 1-5, p. 7, l. 11 - p. 9, l. 12; p. 11, l. 14 - p. 12, l. 19; p. 23, l. 9 - 22) may be translated among the laterally adjacent modular units (e.g., 155, 157, 210,

212, 214). The system (200) further comprises a translation apparatus (e.g., 10, 110, 270, Figures 1-5, p. 7, l. 16 - p. 10, l. 9; p. 16, l. 20 - p. 17, l. 4; p. 20, l. 13 - p. 23, l. 22) for moving the cartridge access device (e.g., 12, 112, 280) along the displacement path(14). The translation apparatus (e.g., 10, 110, 270) may comprise first and second elongate gear racks (e.g., 20, 22) that are positioned in spaced-apart relation and aligned along the displacement path (14). The first elongate gear rack (22) includes an integral elongate guide member (e.g., 50, Figures 1-3, p. 8, l. 23 - p. 9, l. 6; p. 12, l. 14 - p. 13, l. 2; p. 13, l. 22 - p. 14, l. 2) that also extends along the displacement path (14). A first bearing member (54, Figure 3, p. 8, l. 26 - p. 9, l. 6; p. 18, l. 12 - p. 19, l. 15) mounted to the cartridge access device (12) engages the first elongate guide member (50). A first drive pinion (24, Figures 2 and 3, p. 7, l. 21 - 27; p. 16, l. 5 - 19) mounted to the cartridge access device (12) engages the first elongate gear rack (20). A second drive pinion (28, Figures 1-3, p. 7, l. 21 - 27; p. 16, l. 5 - 19) mounted to the cartridge access device (12) engages the second elongate gear rack (22). A pinion drive apparatus (32, Figures 1-3, p. 7, l. 27 - p. 8, l. 5; p. 17, l. 5 - 27) operatively associated with the first and second drive pinions (24, 28) and rotates the first and second drive pinions (24, 28) to move the cartridge access device (12) along the first and second elongate gear racks (20, 22).

The integral gear rack (e.g., 20) and guide member (e.g., 50) arrangement of the various modular units (210, 212, 214) of present invention provides for improved positioning accuracy of the cartridge access device (12), eliminates the need for separate guide members and gear racks, and eliminates the need for such separate guide members and gear racks to be aligned with respect to one another. Yet another advantage of the translation apparatus (10) is that it is readily expandable in the direction of the displacement path (14) by simply adding additional modular units (e.g., 212, 214).

The invention as claimed is more precisely and accurately summarized below with reference numerals and reference to the specification and drawings.

(Claim 1) A modular data storage system (200, Figure 5, p. 21, l. 19 - p. 23, l. 22) for handling and storing data cartridges (18, 118, Figures 1-4, p. 11, l. 14 - p. 12, l. 5), comprising:

a) a cartridge access device (12, 112, 280, Figures 1-5, p. 7, l. 11 - p. 9, l. 12; p. 11, l. 14 - p. 12, l. 19; p. 23, l. 9 - 22);

b) at least two laterally adjacent modular units (155, 157, 210, 212, 214, Figures 4 and 5, p. 20, l. 13 - p. 23, l. 22), each of said modular units comprising:

i) a plurality of cartridge receiving devices (230, 232, 234, Figure 5, p. 22, l. 7 - 17);

ii) a first elongate gear rack (20, Figures 1-3, p. 7, l. 16 - p. 8, l. 5; p. 12, l. 6 - p. 13, l. 2; p. 13, l. 22 - p. 14, l. 2) having first and second ends and aligned along a displacement path (14, Figures 1 and 2, p. 7, l. 11 - p. 8, l. 5; p. 8, l. 18 - p. 10, l. 9);

iii) a first elongate guide member (50, Figures 1-3, p. 8, l. 23 - p. 9, l. 6; p. 12, l. 14 - p. 13, l. 2; p. 13, l. 22 - p. 14, l. 2) integral with said first elongate gear rack (20) and extending along the displacement path (14) substantially between the first and second ends of said first elongate gear rack (20);

iv) a first bearing (54, Figure 3, p. 8, l. 26 - p. 9, l. 6; p. 18, l. 12 - p. 19, l. 15) mounted to the cartridge access device (12, 112, 280), said first bearing engaging (54) said first elongate guide member (50);

v) a second elongate gear rack (22, Figures 1-3, p. 7, l. 16 - p. 8, l. 5; p. 13, l. 3 - p. 14, l. 2) aligned along said displacement path (14) and positioned in spaced-apart relation to said first elongate gear rack (20); and

vi) wherein the first elongate gear racks (20) of said laterally adjacent modular units (155, 157, 210, 212, 214) are substantially in alignment with one another, and the second elongate gear racks (22) of said laterally adjacent modular units (155, 157, 210, 212, 214) are substantially in alignment with one another, such that said cartridge access device (12, 112, 280) may be translated among said laterally adjacent modular units (155, 157, 210, 212, 214);

c) a translation apparatus (10, 110, 270, Figures 1-5, p. 7, l. 16 - p. 10, l. 9; p. 16, l. 20 - p. 17, l. 4; p. 20, l. 13 - p. 23, l. 22) for moving a cartridge access device (12, 112, 280) along a displacement path (14), comprising:

i) a first drive pinion (24, Figures 2 and 3, p. 7, l. 21 - 27; p. 16, l. 5 - 19) mounted to the cartridge access device (12, 112, 280), said first drive pinion (24) engaging said first elongate gear rack (20);

ii) a second drive pinion (28, Figures 1-3, p. 7, l. 21 - 27; p. 16, l. 5 - 19) mounted to the cartridge access device (12, 112, 280), said second drive pinion (28) engaging said second elongate gear rack (22); and

iii) a pinion drive apparatus (32, Figures 1-3, p. 7, l. 27 - p. 8, l. 5; p. 17, l. 5 - 27) operatively associated with said first and second drive pinions (24, 28), said pinion drive apparatus (32) rotating said first and second drive pinions (24, 28) to move the cartridge access device (12, 112, 280) among the first and second elongate gear racks (20, 22) of said laterally adjacent modular units (155, 157, 210, 212, 214).

(Claim 2) Claim 2 is canceled without prejudice to the subject matter contained therein.

(Claim 3) The modular data storage system (200) of claim 1, wherein said first elongate guide member (50) comprises first and second opposed bearing surfaces (78 and 80, respectively, Figure 2, p. 12, l. 14 - 19; p. 18, l. 12 - 25) and wherein said first bearing (54) mounted to the cartridge access device (12, 112, 280) slidably engages the first and second opposed bearing surfaces (78, 80) of said first elongate guide member (20).

(Claim 4) The modular data storage system (200) of claim 3, wherein said second elongate gear rack (22) includes a second elongate guide member (52, Figures 1 and 3, p. 8, l. 23 - p. 9, l. 6; p. 13, l.

3 - 21) that extends along the displacement path (14) substantially between the first and second ends of said second elongate gear rack (22) and wherein said translation apparatus (10, 110, 270) further comprises a second bearing (56, Figure 3, p. 8, l. 26 - p. 9, l. 6; p. 18, l. 12 - p. 19, l. 15) mounted to the cartridge access device (12, 112, 280), said second bearing (56) engaging said second elongate guide member (22).

(Claim 5) The modular data storage system (200) of claim 4, wherein said second elongate guide member (52) comprises first and second opposed bearing surfaces (86 and 88, respectively, Figure 3, p. 13, l. 8 - 12; p. 18, l. 12 - 25) and wherein said second bearing mounted (56) to the cartridge access device (12, 112, 280) slidably engages the first and second opposed bearing surfaces (86, 88) of said second elongate guide member (52).

(Claim 6) The modular data storage system (200) of claim 5, further comprising a third bearing (60, Figure 3, p. 9, l. 7-12; p. 19, l. 16 - p. 20, l. 12) mounted to the cartridge access device (12, 112, 280), said third bearing (60) contacting said first elongate gear rack (20) and allowing the cartridge access device (12, 112, 280) to move along the displacement path (14).

(Claim 7) The modular data storage system (200) of claim 6, wherein said third bearing (60) comprises a wheel.

(Claim 8) A modular data storage system (200, Figure 5, p. 21, l. 19 - p. 23, l. 22) for handling and storing data cartridges (18, 118, Figures 1-4, p. 11, l. 14 - p. 12, l. 5), comprising:

a) a cartridge access device (12, 112, 280, Figures 1-5, p. 7, l. 11 - p. 9, l. 12; p. 11, l. 14 - p. 12, l. 19; p. 23, l. 9 - 22);

b) at least two laterally adjacent modular units (155, 157, 210, 212, 214, Figures 4 and 5, p. 20, l. 13 - p. 23, l. 22), each of said modular units comprising:

i) a plurality of cartridge receiving devices (230, 232, 234, Figure 5, p. 22, l. 7 - 17);

ii) a first elongate gear rack (20, Figures 1-3, p. 7, l. 16 - p. 8, l. 5; p. 12, l. 6 - p. 13, l. 2; p. 13, l. 22 - p. 14, l. 2) aligned along a displacement path (14, Figures 1 and 2, p. 7, l. 11 - p. 8, l. 5; p. 8, l. 18 - p. 10, l. 9);

iii) a second elongate gear rack (22, Figures 1-3, p. 7, l. 16 - p. 8, l. 5; p. 13, l. 3 - p. 14, l. 2) aligned along said displacement path (14) and positioned in spaced-apart relation to said first elongate gear rack (20);

iv) wherein the first elongate gear racks (20) of said laterally adjacent modular units (155, 157, 210, 212, 214) are substantially in alignment with one another, and the second elongate gear racks (22) of said laterally adjacent modular units (155, 157, 210, 212, 214) are substantially in alignment with one another, such that said cartridge access device (12, 112, 280) may be translated among said laterally adjacent modular units (155, 157, 210, 212, 214);

v) a third elongate gear rack (36, Figures 1-3, p. 8, l. 6 - p. 9, l. 6; p. 14, l. 3 - p. 15, l. 4; p. 15, l. 13 - p. 16, l. 4) positioned in generally parallel, spaced-apart relation to said first elongate gear rack (20);

vi) a fourth elongate gear rack (38, Figures 1-3, p. 8, l. 6 - p. 9, l. 6; p. 14, l. 3 - p. 16, l. 4) positioned in generally parallel, spaced-apart relation to said second elongate gear rack (22) so that said first, second, third, and fourth elongate gear racks (20, 22, 36, and 38) define a generally rectangular, parallelopiped configuration with said first and third elongate gear racks (20 and 36) defining a bottom side of the generally rectangular, parallelopiped configuration and said second and fourth elongate gear racks (22 and 38) defining a top side of the generally rectangular, parallelopiped configuration; and

vii) wherein the third elongate gear racks (36) of said laterally adjacent modular units (155, 157, 210, 212, 214) are substantially in alignment with one another, and the fourth elongate gear racks (38) of said laterally adjacent modular units (155, 157, 210, 212, 214) are substantially in alignment with one another, such that said cartridge access device (12, 112, 280) may be translated among said laterally adjacent modular units (155, 157, 210, 212, 214);

c) a translation apparatus (10, 110, 270, Figures 1-5, p. 7, l. 16 - p. 10, l. 9; p. 16, l. 20 - p. 17, l. 4; p. 20, l. 13 - p. 23, l. 22) for moving a cartridge access device (12, 112, 280) along a displacement path (14), comprising:

i) a first drive pinion (24, Figures 2 and 3, p. 7, l. 21 - 27; p. 16, l. 5 - 19) mounted to the cartridge access device (12, 112, 280), said first drive pinion (24) engaging said first elongate gear rack (20);

ii) a second drive pinion (28, Figures 1-3, p. 7, l. 21 - 27; p. 16, l. 5 - 19) mounted to the cartridge access device (12, 112, 280), said second drive pinion (28) engaging said second elongate gear rack (22); and

iii) a pinion drive apparatus (32, Figures 1-3, p. 7, l. 27 - p. 8, l. 5; p. 17, l. 5 - 27) operatively associated with said first and second drive pinions (24, 28), said pinion drive apparatus (32) rotating said first and second drive pinions (24, 28) to move the cartridge access device (12, 112, 280) among the first and second elongate gear racks (20, 22) of said laterally adjacent modular units (155, 157, 210, 212, 214).

(Claim 9) The modular data storage system (200) of claim 8, further comprising:

a) a third drive pinion (40, Figures 2 and 3, p. 8, l. 14 - 17; p. 16, l. 20 - p. 17, l. 4) mounted to the cartridge access device (12, 112, 280) and operatively associated with said pinion drive apparatus (32), said third drive pinion (40) engaging said third elongate

gear rack (36); and

b) a fourth drive pinion (42, Figures 1-3, p. 8, l. 14 - 17; p. 16, l. 20 - p. 17, l. 4) mounted to the cartridge access device (12, 112, 280) and operatively associated with said pinion drive apparatus (32), said fourth drive pinion (42) engaging said fourth elongate gear rack (38).

(Claim 10) The modular data storage system (200) of claim 1, wherein said pinion drive apparatus (32) comprises:

a) a motor (19, Figures 2 and 3, p. 17, l. 5 - 27) having a shaft;

b) a worm (21, Figures 2 and 3, p. 17, l. 5 - 27) attached to the shaft of said motor (19); and

c) a worm gear (23, Figures 2 and 3, p. 17, l. 5 - 27) operatively connected to said first and second drive pinions (24 and 28), said worm gear (23) mounted to engage said worm (21) mounted to the shaft of said motor (19).

(Claim 11) A modular data storage system (200, Figure 5, p. 21, l. 19 - p. 23, l. 22) for handling and storing data cartridges (18, 118, Figures 1-4, p. 11, l. 14 - p. 12, l. 5), comprising:

a) a cartridge access device (12, 112, 280, Figures 1-5, p. 7, l. 11 - p. 9, l. 12; p. 11, l. 14 - p. 12, l. 19; p. 23, l. 9 - 22);

b) a master modular unit (210, Figure 5, p. 21, l. 19 - p. 23, l. 22) and at least one slave modular unit (212, Figure 5, p. 21, l. 19 - p. 23, l. 22), each of said modular units (210, 212) being positioned adjacent one another to form laterally adjacent modular units, each of said modular units (210, 212) comprising:

i) a plurality of cartridge receiving devices (230, 232, 234, Figure 5, p. 22, l. 7 - 17);

ii) a first elongate gear rack (20, Figures 1-3, p. 7, l. 16 - p. 8, l. 5; p. 12,

l. 6 - p. 13, l. 2; p. 13, l. 22 - p. 14, l. 2) having first and second ends and aligned along a displacement path (14, Figures 1 and 2, p. 7, l. 11 - p. 8, l. 5; p. 8, l. 18 - p. 10, l. 9);

iii) a first elongate guide member (50, Figures 1-3, p. 8, l. 23 - p. 9, l. 6; p. 12, l. 14 - p. 13, l. 2; p. 13, l. 22 - p. 14, l. 2) integral with said first elongate gear rack (20) and extending along the displacement path (14) substantially between the first and second ends of said first elongate gear rack (20);

iv) a first bearing (54, Figure 3, p. 8, l. 26 - p. 9, l. 6; p. 18, l. 12 - p. 19, l. 15) mounted to the cartridge access device (12, 112, 280), said first bearing engaging (54) said first elongate guide member (50);

v) a second elongate gear rack (22, Figures 1-3, p. 7, l. 16 - p. 8, l. 5; p. 13, l. 3 - p. 14, l. 2) aligned along said displacement path (14) and positioned in spaced-apart relation to said first elongate gear rack (20); and

vi) wherein the first elongate gear racks (20) of said laterally adjacent modular units (210, 212) are substantially in alignment with one another, and the second elongate gear racks (22) of said laterally adjacent modular units (210, 212) are substantially in alignment with one another, such that said cartridge access device (12, 112, 280) may be translated among said laterally adjacent modular units (210, 212);

c) a translation apparatus (10, 110, 270) for moving a cartridge access device (12, 112, 280) along a displacement path (14), comprising:

i) a first drive pinion (24, Figures 2 and 3, p. 7, l. 21 - 27; p. 16, l. 5 - 19) mounted to the cartridge access device (12, 112, 280), said first drive pinion (24) engaging said first elongate gear rack (20);

ii) a second drive pinion (28, Figures 1-3, p. 7, l. 21 - 27; p. 16, l. 5 - 19) mounted to the cartridge access device (12, 112, 280), said second drive pinion

(28) engaging said second elongate gear rack (22); and

iii) a pinion drive apparatus (32, Figures 1-3, p. 7, l. 27 - p. 8, l. 5; p. 17, l. 5 - 27) operatively associated with said first and second drive pinions (24, 28), said pinion drive apparatus (32) rotating said first and second drive pinions (24, 28) to move the cartridge access device (12, 112, 280) among the first and second elongate gear racks (20, 22) of said laterally adjacent modular units (210, 212);

d) said master modular unit (210) further comprising a power supply (240, Figure 5, p. 22, l. 10 - p. 23, l. 22).

(Claim 12) The modular data storage system (200) of claim 11, said master modular unit (210) further comprising a control system (242, Figure 5, p. 22, l. 11 - p. 23, l. 22) operatively associated with said pinion drive apparatus (32).

(Claim 13) The modular data storage system (200) of claim 11 wherein each of said slave modular units (212) which require electrical power is electrically connected to said power supply (240) in said master modular unit (210).

(Claim 14) Claim 14 is canceled without prejudice to the subject matter contained therein.

(Claim 15) The modular data storage system (200) of claim 11, wherein said first elongate guide member (50) comprises first and second opposed bearing surfaces (78 and 80, respectively, Figure 2, p. 12, l. 14 - 19; p. 18, l. 12 - 25) and wherein said first bearing (54) mounted to the cartridge access device (12, 112, 280) slidably engages the first and second opposed bearing surfaces (78, 80) of said first elongate guide member (20).

(Claim 16) The modular data storage system (200) of claim 15, wherein said second elongate gear rack (22) includes a second elongate guide member (52, Figures 1 and 3, p. 8, l. 23 - p. 9, l. 6; p. 13, l. 3 - 21) that extends along the displacement path (14) substantially between the first and second ends of said second elongate gear rack (22) and wherein said translation apparatus (10, 110, 270) further comprises a second bearing (56, Figure 3, p. 8, l. 26 - p. 9, l. 6; p. 18, l. 12 - p. 19, l. 15) mounted to the cartridge access device (12, 112, 280), said second bearing (56) engaging said second elongate guide member (22).

(Claim 17) The modular data storage system (200) of claim 16, wherein said second elongate guide member (52) comprises first and second opposed bearing surfaces (86 and 88, respectively, Figure 3, p. 13, l. 8 - 12; p. 18, l. 12 - 25) and wherein said second bearing mounted (56) to the cartridge access device (12, 112, 280) slidably engages the first and second opposed bearing surfaces (86, 88) of said second elongate guide member (52).

(Claim 18) The modular data storage system (200) of claim 17, further comprising a third bearing (60, Figure 3, p. 9, l. 7-12; p. 19, l. 16 - p. 20, l. 12) mounted to the cartridge access device (12, 112, 280), said third bearing (60) contacting said first elongate gear rack (20) and allowing the cartridge access device (12, 112, 280) to move along the displacement path (14).

(Claim 19) The modular data storage system (200) of claim 18, wherein said third bearing (60) comprises a wheel.

(Claim 20) The modular data storage system (200) of claim 11, each of said modular units (210, 212) further comprising:

a) a third elongate gear rack (36, Figures 1-3, p. 8, l. 6 - p. 9, l. 6; p. 14, l. 3 - p. 15, l. 4; p. 15, l. 13 - p. 16, l. 4) positioned in generally parallel, spaced-apart relation to said

first elongate gear rack (20);

b) a fourth elongate gear rack (38, Figures 1-3, p. 8, l. 6 - p. 9, l. 6; p. 14, l. 3 - p. 16, l. 4) positioned in generally parallel, spaced-apart relation to said second elongate gear rack (22) so that said first, second, third, and fourth elongate gear racks (20, 22, 36, and 38) define a generally rectangular, parallelopiped configuration with said first and third elongate gear racks (20 and 36) defining a bottom side of the generally rectangular, parallelopiped configuration and said second and fourth elongate gear racks (22 and 38) defining a top side of the generally rectangular, parallelopiped configuration; and

c) wherein the third elongate gear racks (36) of said laterally adjacent modular units (210, 212) are substantially in alignment with one another, and the fourth elongate gear racks (38) of said laterally adjacent modular units (210, 212) are substantially in alignment with one another, such that said cartridge access device (12, 112, 280) may be translated among said laterally adjacent modular units (210, 212).

(Claim 21) The modular data storage system (200) of claim 20, said translation apparatus (10, 110, 270) further comprising:

a) a third drive pinion (40, Figures 2 and 3, p. 8, l. 14 - 17; p. 16, l. 20 - p. 17, l. 4) mounted to the cartridge access device (12, 112, 280) and operatively associated with said pinion drive apparatus (32), said third drive pinion (40) engaging said third elongate gear rack (36); and

b) a fourth drive pinion (42, Figures 1-3, p. 8, l. 14 - 17; p. 16, l. 20 - p. 17, l. 4) mounted to the cartridge access device (12, 112, 280) and operatively associated with said pinion drive apparatus (32), said fourth drive pinion (42) engaging said fourth elongate gear rack (38).

(Claim 22) The modular data storage system (200) of claim 11, wherein said pinion drive

apparatus (32) comprises:

a) a motor (19, Figures 2 and 3, p. 17, l. 5 - 27) having a shaft;

b) a worm (21, Figures 2 and 3, p. 17, l. 5 - 27) attached to the shaft of said motor (19); and

c) a worm gear (23, Figures 2 and 3, p. 17, l. 5 - 27) operatively connected to said first and second drive pinions (24 and 28), said worm gear (23) mounted to engage said worm (21) mounted to the shaft of said motor (19).

(Claim 23) A modular data storage system (200, Figure 5, p. 21, l. 19 - p. 23, l. 22) for handling and storing data cartridges (18, 118, Figures 1-4, p. 11, l. 14 - p. 12, l. 5), comprising:

a) a cartridge access device (12, 112, 280, Figures 1-5, p. 7, l. 11 - p. 9, l. 12; p. 11, l. 14 - p. 12, l. 19; p. 23, l. 9 - 22);

b) at least two laterally adjacent modular units (155, 157, 210, 212, 214, Figures 4 and 5, p. 20, l. 13 - p. 23, l. 22), each of said modular units comprising:

i) a plurality of cartridge receiving devices (230, 232, 234, Figure 5, p. 22, l. 7 - 17); and

ii) an elongate gear rack (20, Figures 1-3, p. 7, l. 16 - p. 8, l. 5; p. 12, l. 6 - p. 13, l. 2; p. 13, l. 22 - p. 14, l. 2) aligned along a displacement path (14, Figures 1 and 2, p. 7, l. 11 - p. 8, l. 5; p. 8, l. 18 - p. 10, l. 9);

c) a translation apparatus (10, 110, 270, Figures 1-5, p. 7, l. 16 - p. 10, l. 9; p. 16, l. 20 - p. 17, l. 4; p. 20, l. 13 - p. 23, l. 22) for moving a cartridge access device (12, 112, 280) along a displacement path (14), comprising:

i) guide means (50, Figures 1-3, p. 8, l. 23 - p. 9, l. 6; p. 12, l. 14 - p. 13, l. 2; p. 13, l. 22 - p. 14, l. 2) integral with said elongate gear rack (20) for guiding the cartridge access device (12, 112, 280) along said displacement path (14);

ii) a drive pinion (24, Figures 2 and 3, p. 7, l. 21 - 27; p. 16, l. 5 - 19) mounted to the cartridge access device (12, 112, 280), said drive pinion (24) engaging said elongate gear rack (20); and

iii) pinion drive means (32, Figures 1-3, p. 7, l. 27 - p. 8, l. 5; p. 17, l. 5 - 27) operatively associated with said drive pinion (24) for rotating said first drive pinion (24) to move the cartridge access device (12, 112, 280) along the displacement path (14);

d) wherein said elongate gear racks (20) of said laterally adjacent modular units (155, 157, 210, 212, 214) are substantially in alignment with one another such that said cartridge access device (12, 112, 280) may be translated among said laterally adjacent modular units (155, 157, 210, 212, 214).

ISSUES

1. Whether claims 1, 3-13, and 15-23 are unpatentable under the judicially-created doctrine of double patenting over claims 1 and 3-24 of Application Serial No. 09/337,802.

2. Whether claims 1, 3-7, 10-13, 15-19, 22, and 23 are unpatentable under 35 U.S.C. §102(e) as being unpatentable over Tadokoro.

GROUPING OF THE CLAIMS

None of the claims stand or fall together. Each claim is patentable on independent grounds as set forth in the ARGUMENT.

ARGUMENT

Opening Statement

The Tadokoro reference does not disclose at least a guide member that is *integral* with a gear rack. To the contrary, Tadokoro utilizes *separate* guide members and gear racks. Accordingly, Tadokoro

cannot support the examiner's anticipation rejections under Section 102.

Appellant's Invention

Appellants' invention is directed to a data storage system comprised of laterally adjacent modular units. In one embodiment, the modular data storage system involves at least two laterally adjacent modular units, each of which may comprise a plurality of cartridge receiving devices and a plurality of elongate gear racks aligned along a displacement path. The elongate gear racks are substantially in alignment with one another such that the cartridge access device may be translated among the laterally adjacent modular units. The system further comprises a translation apparatus for moving a cartridge access device along a displacement path. The translation apparatus may comprise first and second elongate gear racks that are positioned in spaced-apart relation and aligned along a displacement path. The first elongate gear rack includes an integral elongate guide member that also extends along the displacement path. A first bearing member mounted to the cartridge access device engages the first elongate guide member. A first drive pinion mounted to the cartridge access device engages the first elongate gear rack. A second drive pinion mounted to the cartridge access device engages the second elongate gear rack. A pinion drive apparatus operatively associated with the first and second drive pinions and rotates the first and second drive pinions to move the cartridge access device along the first and second elongate gear racks.

The integral gear rack and guide member arrangement of the present invention provides for improved positioning accuracy of the cartridge access device, eliminates the need for separate guide members and gear racks, and eliminates the need for such separate guide members and gear racks to be aligned with respect to one another.

Background

Data storage systems are used to store data storage media devices such as data cartridges at known locations and to retrieve a desired cartridge so that data may be written to or read from the data

cartridge. Such data storage and handling systems are often referred to as "juke box" data storage systems, particularly if they can accommodate a large number of individual data cartridges.

A typical data storage system may include different types of cartridge receiving devices. For example, one type of cartridge receiving device is a cartridge storage rack or "magazine" which has a plurality of individual cartridge storage locations that may be arranged in one or more horizontal rows or arrays. Another type of cartridge receiving device is a cartridge read/write device or "drive."

A data storage system may also include a cartridge access device. Depending on the particular system, the cartridge access device may comprise a cartridge engaging assembly or "picker" which may be adapted to engage the selected data cartridge, withdraw it from its storage location, and carry it to a drive. The drive may then be used to read data from or write data two the cartridge. Once the read/write operation is complete, the cartridge engaging assembly or picker may withdraw the data cartridge from the drive and return it to the appropriate location within the cartridge storage array. In another type of system, the cartridge access device may comprise the drive itself, in which case the data cartridge may be read from or written to without the need to carry the data cartridge to a separate drive.

Regardless of the particular type of cartridge access device that is utilized by the data storage system, the positioning system or translation apparatus used to move the cartridge access device along the cartridge storage array must be capable of moving the cartridge access device along the cartridges stored in the array so that the desired data cartridge may be accessed. One type of positioning system, often referred to as a "lead-screw" system, mounts the cartridge access device on a lead-screw which, when turned, moves the cartridge access device back and forth along the array of cartridges. While such lead-screw positioning systems are being used, they are not without their problems. For example, in such a system the cartridge access device may be cantilevered on the lead-screw which may result in excessive transverse or rotational movement of the cartridge access device. Such excessive movement reduces positional accuracy and may make it difficult for the cartridge access device to reliably engage the desired data cartridge on a repeated basis.

Partly in an effort to solve the foregoing problems, positioning systems have been developed

which utilize separate guide rails or tracks to guide the cartridge access device along the array of cartridges. The cartridge access device is mounted to the separate guide rails or tracks and the lead-screw is then used only to move the cartridge access device to the desired location. Alternatively, a wire-rope (i.e., cable) drive system may be used to move the cartridge access device. While such systems generally provide for increased positional accuracy of a simple cantilevered type of lead-screw arrangement, they are still not without their disadvantages. For example, the guide rail or track assemblies usually comprise machined components finished to a high degree of precision, which adds to the overall cost of the data storage system. Moreover, the guide rail or track assemblies are often difficult to align and may become mis-aligned during subsequent shipping or movement of the data storage system. If the mis-alignment is substantial, it may be necessary to re-align and re-calibrate the positioning system before the data storage system can be placed in operation.

A positioning system/translation apparatus for moving a cartridge access device along an array of cartridges has been described in the parent application, serial no. 09/337,802. This positioning system provides increased positional accuracy to reduce errors due to mis-alignment of the cartridge access device. As described in the parent application, this is achieved with a minimum number of components to maximize reliability and reduce cost, yet does not require the use of expensive, precision-machined components and guide rails. The positioning system also reduces the amount of time required to align and calibrate the assembly during production and reduces the likelihood of subsequent mis-alignment due to shipping or rough handling. The positioning system of the parent application requires less space than prior art positioning systems, thereby allowing for a reduction in the overall size of the data storage system or allowing for an increased number of data cartridges to be stored within the system.

Regardless of the positioning system used, juke box data storage systems may be produced in a variety of sizes and configurations. In order to establish a product definition, a data storage system manufacturer may survey potential customers as to their specific needs. The manufacturer may then design a "point" product around this definition. This process may be repeated for different types of customers which are typically classified as "low-end," "mid-range," or "high-end" customers ("low-end"

customers requiring a more cost-competitive, smaller capacity library than "mid-range" or "high-end" customers). The result may be a series of products not only of different sizes and capacities, but also having unique housings, assemblies, and individual components.

Furthermore, the capacity of each of these products is limited, i.e., within any particular data storage system produced by a manufacturer there is a specific number of cartridge storage locations and drives. This limits the options for a customer whose needs change and who may require a larger data storage system at some point in the future. More particularly, that customer can either purchase another data storage system to use along with the original data storage system, or that customer can purchase a new, larger-capacity data storage system to replace the original one. While the former option involves less initial cost than the latter, there are several disadvantages for the customer to utilize multiple data storage systems rather than purchase a single, larger system. Specifically, each data storage system has its own cartridge access device, data storage racks and drives. There is an unnecessary duplication of components such as the cartridge access device: i.e., the customer needing an upgrade requires more data storage racks and possibly more drives, but not an extra cartridge access device. Furthermore, the magazines and drives from the first data storage system are not accessible by the cartridge access device of the second data storage system, and vice-versa.

Discussion of the Reference

Tadokoro, *et al.*, U.S. Patent No. 6,166,877 (Tadokoro). The Tadokoro reference discloses a cassette auto changer system that includes, among other things, a selection member for selecting between a plurality of cassettes. More specifically, with respect to the embodiment illustrated in Figures 19-21, Tadokoro discloses a cassette transfer mechanism 2 with upper and lower horizontally arranged gear rack members 32 disposed so as to engage upper and lower guide rails 8 positioned on each of the consoles A-D. A vertical pillar 30 is supported between the upper and lower guide rails 8 so as to be moveable in the horizontal plane. Upper and lower end portions 30a and 30b attached to each end of the pillar 30 include a plurality of guide rollers 33 for pressingly engaging the guide rails 8 at three sides

thereof to provide stable support and rolling movement for the cassette transport mechanism 2. A pulley 35 mounted on the drive shaft of motor 34 engages a timing belt 36 which also engages a drive pulley 37 on rotatable shaft 38. Drive gears 39 are engaged with adjacent reduction gears 40 at each side thereof. Smaller pinion gears 41 are coaxially disposed at upper sides of the upper reduction gears 40 and lower sides of the lower reduction gears 40 to engage gear teeth formed on the upper and lower rack members 32.

ISSUE 1: WHETHER CLAIMS 1, 3-13, and 15-23 ARE UNPATENTABLE UNDER THE JUDICIALLY-CREATED DOCTRINE OF DOUBLE PATENTING.

In the first office action, paper no. 6, dated May 8, 2001, the examiner *provisionally* rejected claims 1-23 under the judicially-created doctrine of double patenting over claims 1-24 of co-pending patent application serial no. 09/337,802. In responding to that office action, Appellants acknowledged the examiner's *provisional* double patenting rejection, and indicated that they would respond to the rejection by filing a terminal disclaimer upon the indication that the claims are otherwise allowable.

In the final office action, paper no. 8, dated November 5, 2001, the examiner repeated the identical provisional double patenting rejection. That is, the examiner again rejected claims 1-23 over claims 1-24 of patent application serial no. 09/337,802. In this regard, Appellants note that the examiner's rejection is no longer technically correct, as at the point in time of the issuance of the final office action, only claims 1, 3-13, and 15-23 were pending in the present application. Similarly, only claims 1 and 3-24 were pending in serial no. 09/337,802.

Notwithstanding the erroneous identification of the claims contained in the examiner's double patenting rejection, the examiner's provisional double patenting rejection is not ripe for consideration on appeal since it is provisional in nature. That is, since no claims have yet issued, it is not possible to make a meaningful determination as to whether a double patenting rejection would be warranted. Consequently, Appellants request that the double patenting rejection be held in abeyance until claims of the '802 application are allowed.

ISSUE 2: WHETHER CLAIMS 1, 3-7, 10-13, 15-19, 22, AND 23 ARE UNPATENTABLE UNDER 35 U.S.C. §102(e) AS BEING ANTICIPATED BY TADOKORO.

Claims 1, 3-7, 10-13, 15-19, 22, and 23 currently stand rejected under Section 102(e) as being anticipated by Tadokoro. Appellants note that the examiner did not reject claims 8, 9, 20, and 21 over Tadokoro. Consequently, Appellants regard claims 8, 9, 20, and 21 as being allowable over Tadokoro. Stated another way, by failing to specifically reject claims 8, 9, 20, and 21 over any prior art reference, the examiner has failed to establish the required *prima-facie* case of unpatentability of claims 8, 9, 20, and 21.

Legal Standard For Rejecting Claims
Under 35 U.S.C. §102

The standard for lack of novelty, that is, for "anticipation," under 35 U.S.C. §102 is one of strict identity. To anticipate a claim for a patent, a single prior source must contain all its essential elements. *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 231 USPQ 81, 90 (Fed. Cir. 1986). Invalidity for anticipation requires that all of the elements and limitations of the claims be found within a single prior art reference. *Scripps Clinic & Research Foundation v. Genentech, Inc.*, 18 USPQ2d 1001 (Fed. Cir. 1991). Every element of the claimed invention must be literally present, arranged as in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989) (finding that the jury had been erroneously instructed that anticipation may be shown by equivalents, a legal theory that is pertinent to obviousness under Section 103, not to anticipation under Section 102). "The identical invention must be shown in as complete detail as is contained in the patent claim." MPEP §2131 (7th Ed. 1998) (citing *Richardson, supra*). Furthermore, functional language, preambles, and language in "whereby," "thereby," and "adapted to" clauses cannot be disregarded. *Pac-Tec, Inc. v. Amerace Corp.*, 14 USPQ2d 1871 (Fed. Cir. 1990).

The burden of establishing a *prima-facie* case of anticipation resides with the U.S. Patent and Trademark Office. *Ex parte Skinner*, 2 USPQ2d 1788, 1788-1789 (Bd. Pat. Int. 1986) (holding that the examiner failed to establish *prima-facie* case of anticipation). The examiner has "the burden of proof

. . . to produce the factual basis for its rejection of an application under Sections 102 or 103." *In re Piasecki*, 223 USPQ 785, 788 (Fed. Cir. 1984) (quoting *In re Warner*, 154 USPQ 173, 177 (CCPA 1967)). Only if that burden is met, does the burden of going forward shift to the applicant.

The Examiner's Rejections

The examiner rejected claims 1, 3-7, 10-13, 15-19, 22, and 23 under 35 U.S.C. §102(e) as being anticipated by Tadokoro. It is the position of the examiner that the Tadokoro reference discloses each and every element and meets each and every limitation set forth in claims 1, 3-7, 10-13, 15-19, 22, and 23. The examiner's rejections are improper in that Tadokoro fails to disclose elements and limitations that are specifically required by the rejected claims. Consequently, the examiner has failed to establish the required *prima-facie* case of anticipation.

Turning now to the present invention, each of claims 1, 3-7, and 10 requires that the translation apparatus comprise a first elongate gear rack (e.g., 20) and a first elongate guide member (e.g., 50) that is **integral** with the first elongate gear rack. See also Figures 1-3 of the currently pending application. The Tadokoro device does not meet this limitation. To the contrary, Tadokoro describes **separate** gear racks 32 and guide members 8, and they are shown as separate members in the drawings of the Tadokoro patent. See, for example, Figures 20 and 22 of Tadokoro. Moreover, in col. 14, lines 9-13, Tadokoro describes that the rack members 32 are "disposed so as to engage the upper and lower guide rails 8, 8." That Tadokoro describes the rack members 32 as being "disposed to engage" the upper and lower guide rails 8 means that they are separate, not integral, elements. Significantly, the examiner has never identified any language or drawing figure in Tadokoro that contradicts this fact. Stated another way, Tadokoro's two-piece guide member and gear rack arrangement teaches away from the one-piece, integral arrangement of the present invention. Anticipation requires an identity of elements and limitations. Tadokoro does not contain those elements and limitations. Therefore, Tadokoro cannot anticipate. That is, each of claims 1, 3-7, and 10 requires a guide member 50 that is **integral** with the guide rail 20. Tadokoro's guide rails 8 are **separate** from his gear racks 32. Therefore, Tadokoro cannot,

as a matter of law, anticipate any of claims 1, 3-7, and 10.

The Appellants made the foregoing points in their response to the first office action, only to have the examiner disagree about the meaning of the term "integral." That is, on page 3, section 4 of the final office action, the examiner asserts that the term "integral" does not necessarily mean one piece. Appellants disagree. The term integral, as used in the currently pending claims, means just that, i.e., that the guide member is formed from the same member as the gear rack. This arrangement is disclosed in the specification and is responsible for a significant advantage of the invention, i.e., that there is no need to separately align the gear rack and guide member. While the examiner asserts that the courts have defined integral as embracing constructions that are united by such means as "fastening and welding," the examiner provides no citation of any case to support his statement. Even if he did, such a citation would not be controlling in this case, as claim terms are to be construed in light of the teachings of the specification. See, for example, *CVI/Beta Ventures, Inc. v. Tura LP*, 42 USPQ2d 1577 (Fed. Cir. 1997). Reference to the currently pending specification makes clear that the guide member and gear racks are formed from the same member, thus giving meaning to the term "integral" as that term is used in the currently pending claims. See, for example, the description contained at page 10, lines 18-21:

> ". . .since the lateral positioning of the cartridge access device 12 is provided by the guide member portions 50 and 52 provided on the first and second elongate gear racks 20 and 22."

and on page 12, lines 14-17:

> "The first or lower elongate gear rack 20 also may be provided with an elongate guide member 50 which, in one preferred embodiment, may take the form of a turned-up edge of the elongate gear rack 20, as is also best seen in Figure 2."

and on page 13, line 27 - page 14, line 2 (when discussing an example embodiment):

> ". . .both the lower and upper gear racks 20 and 22 are fabricated from sheet metal with the respective guide member portions 50 and 52 thereof comprising up-turned and down-turned edge portions, respectively."

In summation, the Tadokoro reference fails to disclose each and every element set forth in claim 1. That is, Tadokoro does not disclose at least:

> "A modular data storage system for handling and storing data cartridges, comprising:

a) a cartridge access device;

b) at least two laterally adjacent modular units, each of said modular units comprising:

i) a plurality of cartridge receiving devices;

ii) a first elongate gear rack having first and second ends and aligned along a displacement path;

iii) a first elongate guide member integral with said first elongate gear rack and extending along the displacement path substantially between the first and second ends of said first elongate gear rack;

iv) a first bearing mounted to the cartridge access device, said first bearing engaging said first elongate guide member;

v) a second elongate gear rack aligned along said displacement path and positioned in spaced-apart relation to said first elongate gear rack; and

vi) wherein the first elongate gear racks of said laterally adjacent modular units are substantially in alignment with one another, and the second elongate gear racks of said laterally adjacent modular units are substantially in alignment with one another, such that said cartridge access device may be translated among said laterally adjacent modular units;

c) a translation apparatus for moving a cartridge access device along a displacement path, comprising:

i) a first drive pinion mounted to the cartridge access device, said first drive pinion engaging said first elongate gear rack;

ii) a second drive pinion mounted to the cartridge access device, said second drive pinion engaging said second elongate gear rack; and

iii) a pinion drive apparatus operatively associated with said first and second drive pinions, said pinion drive apparatus rotating said first and second

drive pinions to move the cartridge access device among the first and second elongate gear racks of said laterally adjacent modular units."

Claim 3 is allowable on further independent grounds in that Tadokoro does not disclose the modular data storage system as defined by claim 1, wherein the first elongate guide member comprises "first and second opposed bearing surfaces and wherein said first bearing mounted to the cartridge access device slidably engages the first and second opposed bearing surfaces" of the first elongate guide member, as set forth in claim 3. Tadokoro's vertical guide member is guided along the guide member 8 by wheels 33, not by slidable engagement. See Figure 22 of Tadokoro. Because Tadokoro does not separately meet the limitations of claim 3, Tadokoro cannot anticipate claim 3.

Claim 4 is allowable on further independent grounds in that the Tadokoro reference does not disclose the modular data storage system as defined by claim 3, wherein the second elongate gear rack includes "a second elongate guide member that extends along the displacement path" and wherein the translation apparatus further comprises "a second bearing mounted to the cartridge access device, the second bearing engaging said second elongate guide member," as set forth in claim 4. Here again, any comparison of claim 4 with Tadokoro is inapt since Tadokoro's gear rack 32 is not a guide member. That is, since Tadokoro gear rack is not a guide member, there is no starting point for determining whether Tadokoro's gear rack includes "a second elongate guide member" as that term is to be construed in the context of claim 4. Tadokoro cannot anticipate claim 4, because Tadokoro fails to meet the additional structural limitations recited in claim 4.

Claim 5 is allowable on further independent grounds in that Tadokoro does not disclose the modular data storage system as defined by claim 4, wherein the second elongate guide member comprises "first and second opposed bearing surfaces and wherein said second bearing mounted to the cartridge access device slidably engages the first and second opposed bearing surfaces" of the second elongate guide member as set forth in claim 5. Tadokoro's vertical guide member is guided along the guide member 8 by wheels 33, not by slidable engagement. See Figure 22 of Tadokoro. Accordingly,

Tadokoro cannot anticipate claim 6.

Claim 6 is allowable on further independent grounds in that the Tadokoro reference does not disclose the modular data storage system as defined by claim 5, further comprising a "third bearing mounted to the cartridge access device, said third bearing contacting said first elongate gear rack" as set forth in claim 6. Tadokoro's gear rack 32 does not provide a guidance function nor does Tadokoro disclose a bearing that contacts his gear rack. The failure of Tadokoro to disclose a bearing that contacts a gear rack means that Tadokoro cannot anticipate claim 6.

Claim 7 is allowable on further independent grounds in that Tadokoro does not disclose the modular data storage system of claim 6, wherein the third bearing comprises a wheel. Again, Tadokoro discloses no third bearing that contacts a gear rack, much less a wheel that contacts a gear rack. Instead, Tadokoro's wheel contacts his guide member 8, not his gear rack 32. Therefore, Tadokoro cannot anticipate claim 7.

Claim 10 is allowable on further independent grounds in that Tadokoro does not disclose the modular data storage system of claim 1, wherein the pinion drive apparatus comprises "a motor. . . a worm attached to the shaft of the motor and a worm gear operatively connected to said first and second drive pinions. . ." the worm gear also engaging the worm as set forth in claim 10. Tadokoro discloses a motor 34 that drives the pinions 41 via a drive belt 36. See Figure 20 of Tadokoro. A drive belt 36 is not a worm and worm gear. Since these additional limitations of claim 12 are not met, Tadokoro cannot anticipate claim 10.

Independent claim 11 contains similar limitations that are not met by the Tadokoro reference. Specifically, claim 11 requires a "first elongate gear rack" and a "first elongate guide member integral with said first elongate gear rack." Again, Tadokoro's guide members 8 are not integral with his gear racks 32. Indeed, Tadokoro specifically teaches away from such an arrangement by stating that the rack members 32 engage the rails 8. Clearly, Tadokoro's guide members cannot be said to be integral with the gear rack, as specifically required by claim 11. Again, because the Tadokoro reference does not disclose an "elongate guide member" that is "integral with" a gear rack, Tadokoro cannot anticipate claim

11. Consequently, claim 11 is also allowable under Section 102(e).

Stated another way, independent claim 11 is allowable over Tadokoro in that Tadokoro fails to disclose at least:

"A modular data storage system for handling and storing data cartridges, comprising:

a) a cartridge access device;

b) a master modular unit and at least one slave modular unit, each of said modular units being positioned adjacent one another to form laterally adjacent modular units, each of said modular units comprising:

i) a plurality of cartridge receiving devices;

ii) a first elongate gear rack having first and second ends and aligned along a displacement path;

iii) a first elongate guide member integral with said first elongate gear rack and extending along the displacement path substantially between the first and second ends of said first elongate gear rack;

iv) a first bearing mounted to the cartridge access device, said first bearing engaging said first elongate guide member;

v) a second elongate gear rack aligned along said displacement path and positioned in spaced-apart relation to said first elongate gear rack; and

vi) wherein the first elongate gear racks of said laterally adjacent modular units are substantially in alignment with one another, and the second elongate gear racks of said laterally adjacent modular units are substantially in alignment with one another, such that said cartridge access device may be translated among said laterally adjacent modular units;

c) a translation apparatus for moving a cartridge access device along a displacement path, comprising:

i) a first drive pinion mounted to the cartridge access device, said first

drive pinion engaging said first elongate gear rack;

ii) a second drive pinion mounted to the cartridge access device, said second drive pinion engaging said second elongate gear rack; and

iii) a pinion drive apparatus operatively associated with said first and second drive pinions, said pinion drive apparatus rotating said first and second drive pinions to move the cartridge access device among the first and second elongate gear racks of said laterally adjacent modular units;

d) said master modular unit further comprising a power supply."

Claim 12 is allowable in that claim 12 depends from claim 11, which is allowable.

Claim 13 is allowable on further independent grounds in that Tadokoro does not disclose the modular data storage system as defined by claim 11, wherein "each of said slave units which require electrical power is electrically connected to said power supply in said master modular unit" as set forth in claim 13. Tadokoro does not disclose such a power supply arrangement. Accordingly, Tadokoro does not anticipate claim 13.

Claim 15 is allowable on further independent grounds in that Tadokoro does not disclose the modular data storage system as defined by claim 11, wherein the first elongate guide member comprises "first and second opposed bearing surfaces and wherein said first bearing mounted to the cartridge access device slidably engages the first and second opposed bearing surfaces" of the first elongate guide member, as set forth in claim 15. Tadokoro's vertical guide member is guided along the guide member 8 by wheels 33, not by slidable engagement. See Figure 22 of Tadokoro. Because Tadokoro does not separately meet the limitations of claim 15, Tadokoro cannot anticipate claim 15.

Claim 16 is allowable on further independent grounds in that Tadokoro does not disclose the modular data storage system as defined by 15, wherein the second elongate gear rack includes "a second elongate guide member that extends along the displacement path" and wherein the translation apparatus further comprises "a second bearing mounted to the cartridge access device, the second bearing engaging

said second elongate guide member," as set forth in claim 16. Here again, any comparison of claim 16 with Tadokoro is inapt since Tadokoro's gear rack 32 is not a guide member. That is, since Tadokoro gear rack is not a guide member, there is no starting point for determining whether Tadokoro's gear rack includes "a second elongate guide member" as that term is to be construed in the context of claim 16. Tadokoro cannot anticipate claim 16, because Tadokoro fails to meet the additional structural limitations recited in claim 16.

Claim 17 is allowable on further independent grounds in that Tadokoro does not disclose the modular data storage system as defined by claim 16, wherein the second elongate guide member comprises "first and second opposed bearing surfaces and wherein said second bearing mounted to the cartridge access device slidably engages the first and second opposed bearing surfaces" of the second elongate guide member as set forth in claim 17. Tadokoro's vertical guide member is guided along the guide member 8 by wheels 33, not by slidable engagement. See Figure 22 of Tadokoro. Accordingly, Tadokoro cannot anticipate claim 17.

Claim 18 is allowable on further independent grounds in that the Tadokoro reference does not disclose the modular data storage system defined by claim 17, further comprising a "third bearing mounted to the cartridge access device, said third bearing contacting said first elongate gear rack" as set forth in claim 18. Tadokoro's gear rack 32 does not provide a guidance function nor does Tadokoro disclose a bearing that contacts his gear rack. The failure of Tadokoro to disclose a bearing that contacts a gear rack means that Tadokoro cannot anticipate claim 18.

Claim 19 is allowable on further independent grounds in that Tadokoro does not disclose the modular data storage system of claim 18, wherein the third bearing comprises a wheel. Again, Tadokoro discloses no third bearing that contacts a gear rack, much less a wheel that contacts a gear rack. Therefore, Tadokoro cannot anticipate claim 19.

Claim 20 is allowable on further independent grounds in that Tadokoro does not disclose the modular data storage system as defined by claim 11, wherein each of the modular units further comprise a "third elongate gear rack" and a "fourth elongate gear rack" positioned adjacent the "first" and

"second" elongate gear racks so that the "first, second, third, and fourth elongate gear racks define a generally rectangular, parallelepiped configuration" in the manner set forth in claim 20. Tadokoro's gear racks are arranged to form two parallel upper and lower tracks. Tadokoro's upper and lower tracks do not define a "generally rectangular, parallelepiped configuration" as required by claim 20. Therefore, Tadokoro cannot anticipate claim 20.

Claim 21 is allowable in that claim 21 depends from claim 20, which is allowable.

Claim 22 is allowable on further independent grounds in that Tadokoro does not disclose the modular data storage system of claim 22, wherein the pinion drive apparatus comprises "a motor. . . a worm attached to the shaft of the motor and a worm gear operatively connected to said first and second drive pinions. . ." the worm gear also engaging the worm as set forth in claim 10. Tadokoro discloses a motor 34 that drives the pinions 41 via a drive belt 36. See Figure 20 of Tadokoro. A drive belt 36 is not a worm and worm gear. Since these additional limitations of claim 22 are not met, Tadokoro cannot anticipate claim 22.

Independent claim 23 contains similar limitations that are not met by the Tadokoro reference. Specifically, claim 23 requires an "elongate gear rack" and "guide means integral with said elongate gear rack." Again, Tadokoro's guide members 8 are not integral with his gear racks 32. In fact, Tadokoro specifically teaches away from such an arrangement by stating that the rack members 32 engage the rails 8, clearly implying that the two comprise separate components. Because the Tadokoro reference does not disclose "guide means" that is "integral with" an "elongate gear rack," Tadokoro cannot anticipate claim 23. Consequently, claim 23 is also allowable under Section 102(e).

Stated another way, independent claim 23 is allowable over Tadokoro in that Tadokoro fails to disclose at least:

> "A modular data storage system for handling and storing data cartridges, comprising:
>
> a) a cartridge access device;
>
> b) at least two laterally adjacent modular units, each of said modular units comprising:

i) a plurality of cartridge receiving devices; and

ii) an elongate gear rack aligned along a displacement path;

c) a translation apparatus for moving a cartridge access device along a displacement path, comprising:

i) guide means integral with said elongate gear rack for guiding the cartridge access device along said displacement path;

ii) a drive pinion mounted to the cartridge access device, said drive pinion engaging said elongate gear rack; and

iii) pinion drive means operatively associated with said drive pinion for rotating said first drive pinion to move the cartridge access device along the displacement path;

d) wherein said elongate gear racks of said laterally adjacent modular units are substantially in alignment with one another such that said cartridge access device may be translated among said laterally adjacent modular units."

CONCLUSION

The Tadokoro reference does not disclose at least a guide member that is integral with a gear rack. Therefore, Tadokoro cannot be used to establish the required *prima-facie* case of anticipation of claims 1, 3-7, 10-13, 15-19, 22, and 23. Accordingly, Appellants urge the Board to reverse the examiner's rejections.

Respectfully submitted,

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APPENDIX A

1. A modular data storage system for handling and storing data cartridges, comprising:

a) a cartridge access device;

b) at least two laterally adjacent modular units, each of said modular units comprising:

i) a plurality of cartridge receiving devices;

ii) a first elongate gear rack having first and second ends and aligned along a displacement path;

iii) a first elongate guide member integral with said first elongate gear rack and extending along the displacement path substantially between the first and second ends of said first elongate gear rack;

iv) a first bearing mounted to the cartridge access device, said first bearing engaging said first elongate guide member;

v) a second elongate gear rack aligned along said displacement path and positioned in spaced-apart relation to said first elongate gear rack; and

vi) wherein the first elongate gear racks of said laterally adjacent modular units are substantially in alignment with one another, and the second elongate gear racks of said laterally adjacent modular units are substantially in alignment with one another, such that said cartridge access device may be translated among said laterally adjacent modular units;

c) a translation apparatus for moving a cartridge access device along a displacement path, comprising:

i) a first drive pinion mounted to the cartridge access device, said first drive pinion engaging said first elongate gear rack;

ii) a second drive pinion mounted to the cartridge access device, said second drive pinion engaging said second elongate gear rack; and

iii) a pinion drive apparatus operatively associated with said first and second drive pinions, said pinion drive apparatus rotating said first and second drive pinions to move the cartridge access device among the first and second elongate gear racks of said laterally adjacent modular units.

2. Claim 2 is canceled without prejudice to the subject matter contained therein.

3. The modular data storage system of claim 1, wherein said first elongate guide member comprises first and second opposed bearing surfaces and wherein said first bearing mounted to the cartridge access device slidably engages the first and second opposed bearing surfaces of said first elongate guide member.

4. The modular data storage system of claim 3, wherein said second elongate gear rack includes a second elongate guide member that extends along the displacement path substantially between the first and second ends of said second elongate gear rack and wherein said translation apparatus further comprises a second bearing mounted to the cartridge access device, said second bearing engaging said second elongate guide member.

5. The modular data storage system of claim 4, wherein said second elongate guide member comprises first and second opposed bearing surfaces and wherein said second bearing mounted to the cartridge access device slidably engages the first and second opposed bearing surfaces of said second elongate guide member.

6. The modular data storage system of claim 5, further comprising a third bearing mounted to the cartridge access device, said third bearing contacting said first elongate gear rack and allowing the cartridge access device to move along the displacement path.

7. The modular data storage system of claim 6, wherein said third bearing comprises a wheel.

8. A modular data storage system for handling and storing data cartridges, comprising:

a) a cartridge access device;

b) at least two laterally adjacent modular units, each of said modular units comprising:

i) a plurality of cartridge receiving devices;

ii) a first elongate gear rack aligned along a displacement path;

iii) a second elongate gear rack aligned along said displacement path and positioned in spaced-apart relation to said first elongate gear rack;

iv) wherein the first elongate gear racks of said laterally adjacent modular units are substantially in alignment with one another, and the second elongate gear racks of said laterally adjacent modular units are substantially in alignment with one another, such that said cartridge access device may be translated among said laterally adjacent modular units;

v) a third elongate gear rack positioned in generally parallel, spaced-apart relation to said first elongate gear rack;

vi) a fourth elongate gear rack positioned in generally parallel, spaced-apart relation to said second elongate gear rack so that said first, second, third, and fourth elongate gear racks define a generally rectangular, parallelopiped configuration with said first and third elongate gear racks defining a bottom side of the generally rectangular, parallelopiped configuration and said second and fourth elongate gear racks defining a top side of the generally rectangular, parallelopiped configuration; and

vii) wherein the third elongate gear racks of said laterally adjacent modular

units are substantially in alignment with one another, and the fourth elongate gear racks of said laterally adjacent modular units are substantially in alignment with one another, such that said cartridge access device may be translated among said laterally adjacent modular units;

c) a translation apparatus for moving a cartridge access device along a displacement path, comprising:

i) a first drive pinion mounted to the cartridge access device, said first drive pinion engaging said first elongate gear rack;

ii) a second drive pinion mounted to the cartridge access device, said second drive pinion engaging said second elongate gear rack; and

iii) a pinion drive apparatus operatively associated with said first and second drive pinions, said pinion drive apparatus rotating said first and second drive pinions to move the cartridge access device among the first and second elongate gear racks of said laterally adjacent modular units.

9. The modular data storage system of claim 8, further comprising:

a) a third drive pinion mounted to the cartridge access device and operatively associated with said pinion drive apparatus, said third drive pinion engaging said third elongate gear rack; and

b) a fourth drive pinion mounted to the cartridge access device and operatively associated with said pinion drive apparatus, said fourth drive pinion engaging said fourth elongate gear rack.

10. The modular data storage system of claim 1, wherein said pinion drive apparatus comprises:

a) a motor having a shaft;

b) a worm attached to the shaft of said motor; and

c) a worm gear operatively connected to said first and second drive pinions, said worm gear mounted to engage said worm mounted to the shaft of said motor.

11. A modular data storage system for handling and storing data cartridges, comprising:

a) a cartridge access device;

b) a master modular unit and at least one slave modular unit, each of said modular units being positioned adjacent one another to form laterally adjacent modular units, each of said modular units comprising:

i) a plurality of cartridge receiving devices;

ii) a first elongate gear rack having first and second ends and aligned along a displacement path;

iii) a first elongate guide member integral with said first elongate gear rack and extending along the displacement path substantially between the first and second ends of said first elongate gear rack;

iv) a first bearing mounted to the cartridge access device, said first bearing engaging said first elongate guide member;

v) a second elongate gear rack aligned along said displacement path and positioned in spaced-apart relation to said first elongate gear rack; and

vi) wherein the first elongate gear racks of said laterally adjacent modular units are substantially in alignment with one another, and the second elongate gear racks of said laterally adjacent modular units are substantially in alignment with one another, such that said cartridge access device may be translated among said laterally adjacent modular units;

c) a translation apparatus for moving a cartridge access device along a displacement path, comprising:

i) a first drive pinion mounted to the cartridge access device, said first drive pinion engaging said first elongate gear rack;

ii) a second drive pinion mounted to the cartridge access device, said second drive pinion engaging said second elongate gear rack; and

iii) a pinion drive apparatus operatively associated with said first and second drive pinions, said pinion drive apparatus rotating said first and second drive pinions to move the cartridge access device among the first and second elongate gear racks of said laterally adjacent modular units;

d) said master modular unit further comprising a power supply.

12. The modular data storage system of claim 11, said master modular unit further comprising a control system operatively associated with said pinion drive apparatus.

13. The modular data storage system of claim 11 wherein each of said slave modular units which require electrical power is electrically connected to said power supply in said master modular unit.

14. Claim 14 is canceled without prejudice to the subject matter contained therein.

15. The modular data storage system of claim 11, wherein said first elongate guide member comprises first and second opposed bearing surfaces and wherein said first bearing mounted to the cartridge access device slidably engages the first and second opposed bearing surfaces of said first elongate guide member.

16. The modular data storage system of claim 15, wherein said second elongate gear rack includes a second elongate guide member that extends along the displacement path substantially between the first and second ends of said second elongate gear rack and wherein said translation apparatus further

comprises a second bearing mounted to the cartridge access device, said second bearing engaging said second elongate guide member.

17. The modular data storage system of claim 16, wherein said second elongate guide member comprises first and second opposed bearing surfaces and wherein said second bearing mounted to the cartridge access device slidably engages the first and second opposed bearing surfaces of said second elongate guide member.

18. The modular data storage system of claim 17, further comprising a third bearing mounted to the cartridge access device, said third bearing contacting said first elongate gear rack and allowing the cartridge access device to move along the displacement path.

19. The modular data storage system of claim 18, wherein said third bearing comprises a wheel.

20. The modular data storage system of claim 11, each of said modular units further comprising:

a) a third elongate gear rack positioned in generally parallel, spaced-apart relation to said first elongate gear rack;

b) a fourth elongate gear rack positioned in generally parallel, spaced-apart relation to said second elongate gear rack so that said first, second, third, and fourth elongate gear racks define a generally rectangular, parallelopiped configuration with said first and third elongate gear racks defining a bottom side of the generally rectangular, parallelopiped configuration and said second and fourth elongate gear racks defining a top side of the generally rectangular, parallelopiped configuration; and

c) wherein the third elongate gear racks of said laterally adjacent modular units are

substantially in alignment with one another, and the fourth elongate gear racks of said laterally adjacent modular units are substantially in alignment with one another, such that said cartridge access device may be translated among said laterally adjacent modular units.

21. The modular data storage system of claim 20, said translation apparatus further comprising:

a) a third drive pinion mounted to the cartridge access device and operatively associated with said pinion drive apparatus, said third drive pinion engaging said third elongate gear rack; and

b) a fourth drive pinion mounted to the cartridge access device and operatively associated with said pinion drive apparatus, said fourth drive pinion engaging said fourth elongate gear rack.

22. The modular data storage system of claim 11, wherein said pinion drive apparatus comprises:

a) a motor having a shaft;

b) a worm attached to the shaft of said motor; and

c) a worm gear operatively connected to said first and second drive pinions, said worm gear mounted to engage said worm mounted to the shaft of said motor.

23. A modular data storage system for handling and storing data cartridges, comprising:

a) a cartridge access device;

b) at least two laterally adjacent modular units, each of said modular units comprising:

i) a plurality of cartridge receiving devices; and

ii) an elongate gear rack aligned along a displacement path;

c) a translation apparatus for moving a cartridge access device along a displacement path, comprising:

i) guide means integral with said elongate gear rack for guiding the cartridge access device along said displacement path;

ii) a drive pinion mounted to the cartridge access device, said drive pinion engaging said elongate gear rack; and

iii) pinion drive means operatively associated with said drive pinion for rotating said first drive pinion to move the cartridge access device along the displacement path;

d) wherein said elongate gear racks of said laterally adjacent modular units are substantially in alignment with one another such that said cartridge access device may be translated among said laterally adjacent modular units.

APPENDIX B

Reference Relied on By Examiner in his Final Response.

A copy of the following reference is attached hereto for the Board's convenience:

Tadokoro, *et al.*, U.S. Patent No. 6,166,877, issued December 26, 2000, entitled "Cassette Auto Changer System Including Tape Signal Reading Means and Selection Means for Selecting Between a Plurality of Cassettes."